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AUTHOR	Saurino, Dan R.; Saurino, Penelope L.
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ABSTRACT

This study used collaborative interactive group action research (CIGAR) to answer research questions about the use of video teleconferencing (VTEL) as a distance learning tool to enrich the preparation of preservice teachers. CIGAR, for the purposes of this study, is defined as a group of preservice teachers and university researchers actively working together to attempt to improve their practice. The research group for the study consisted of two groups of preservice elementary and secondary teachers and two university collaborators. Actions included learning and completing a cycle of CIGAR during normal student teaching through the use of distance technology, which included VTEL and e-mail and chat rooms. Through VTEL students were able to reflect on their own growth as teachers by comparing and contrasting their experiences with those of others in different cultures and locations who were involved in similar CIGAR projects. Overall, VTEL facilitated sharing of different viewpoints and teaching strategies and appeared to be an acceptable medium to expand the use of CIGAR to distance sites. (Contains 2 figures and 17 references.) (SLD)

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Expanding the Use of Collaborative Interactive Group Action Research Through Distance Technology

Dan R. Saurino

Eastern Oregon University

Penelope L. Saurino

Boise State University

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Expanding the Use of Collaborative Interactive Group Action Research Through Distance Technology

Universities and Colleges have attempted to enhance education through the use of video teleconferencing (VTEL) for the past several years. Our video teleconferencing involved communication between two of our campuses using two-way audio and video equipment to allow two groups to interact. While our use of VTEL was a form of distance learning, Schiller and Mitchell (1993) researched the possibilities of various techniques when utilizing video teleconferencing. Technology was considered effective when students and teachers indicated a high level of interaction, as though everyone were in the same room. The advantages of video teleconferencing, according to Miller and associates (1993) include the increased number of students in a particular session or course, and the reduction in travel time for all individuals involved. While we believe the didactic benefits of VTEL are plentiful, Miller maintained that distance learning has been developed primarily because of economic concerns, and not because achievement might be enhanced. In another study, Freeman (1998) researched the advantages and disadvantages of focusing on large classes with multiple campuses involved. He indicated there were substantial costs involved at the onset of utilizing this technology, however, the advantage of reduction in both costs and time over the life of the course might be another advantage. Although colleges are learning to make student participation more than just "watching television," programs are struggling to combine the curriculum to meet the personal needs of each student (Pirkl, 1990) and VTEL might prove to be advantageous in that area.

Research Focus

An emerging research tool used in recent years to better understand and improve teacher thinking has been the use of collaboration and collaborative action research (Pate, 1997; Elliott, 1990; Noffke & Zeichner, 1987; Carr & Kemmis, 1983). In our study, we were interested in how the use of these collaborative techniques might be expanded with our pre-service teachers through the use of VTEL (distance) technology. It is worthy of note that when we refer to action research by any name, we are actually referring to a subset of action research called collaborative action research. More specifically, we are further referring to a subset of collaborative action research that we will define as collaborative interactive group action research (CIGAR). In our study, we made use of collaborative interactive group action research to answer our research question concerning the use of VTEL as a distance-learning tool to enrich the preparation of our pre-service teachers.

Definitions

The overall concept of "action research," as illustrated in Figure 1, has its foundation in the work of Kurt Lewin (1947). Lewin is most often cited as the "founder" of this form of research, which he called "action research," because he combined interventive actions and group research. Lewin took an existing group, introducing a change or action to it through a group facilitator, and observing the impact of such change or action. Lewin's study of "group dynamics" used a cylindrical process involving a recursive, nonlinear pattern of planning, acting, observing, and reflecting on changes in social situations observed by the facilitator. For the purposes of our study, we are using Lewin's definition of action research as the basis of our definition of collaborative interactive group action research.

Our collaborative action research is about pre-service teachers becoming more acutely aware of what is happening in their preparation process and developing a research focus based upon their practice (Sanger, 1990). We are now finding that action research has and will continue to be used to look at roles and processes that initiate changes not only in education, but in areas such as industry, community, development, and the military (Noffke, 1995). The addition of the word "collaborative" to action research, illustrated as a subset of action research in Figure 1, implies that two or more researchers are working together. These researchers are actively exchanging ideas and expertise and are

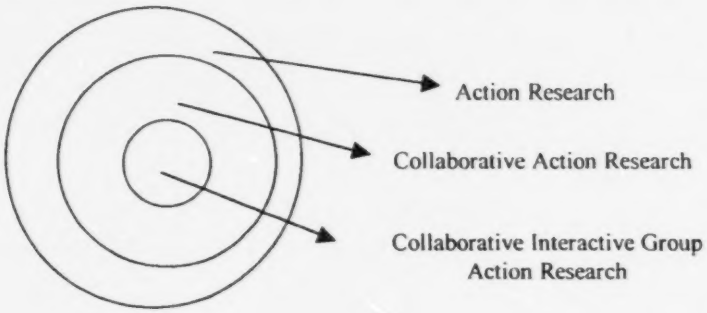

Figure 1. Relationship of collaborative interactive group action research to collaborative action research and action research

continually interacting as they conduct action research in an effort to be more productive than if they worked alone. The collaborators meet together regularly to plan, conduct, reflect, and write about the action research they are conducting. There are different forms of collaboration and the setting for our collaborative efforts was a collaborative group of pre-service teachers and university educators. The use of the words "interactive group,"

illustrated by the smallest subset of action research in Figure 1, emphasizes the true value of our approach to research because the research is done by a group of educators all involved in classroom-based research. The group setting allowed for regular interaction among the researchers and a place for discussion, brainstorming, reflection, accountability, and organization of the process. The VTEL equipment allowed for the research to be accomplished at a distance.

Defining CIGAR

In summary, we define collaborative interactive group action research for the purpose of this study as a group of pre-service teachers and university researchers actively working together to ask questions of interest in an attempt to find answers that might help improve their practice. The ultimate beneficiaries of the process are the students, yet the teachers and university researchers also benefit from the new and relevant knowledge gained by experiencing the process. In addition, we see collaborative interactive group action research as a methodology, a process of conducting research using a particular sequence of research strategies, distance technologies, and theoretical perspectives (Saurino et al., 2000; Saurino, 1998; Saurino & Saurino, 1996).

The varieties of collaborative action research are as numerous as the potential topics that can be addressed. However, the various types of action research do have a few common characteristics. Collaborative action research is generally qualitative in nature, aimed at developing new insights into schooling, education, teaching, learning, and/or finding new approaches to solving problems in education. Collaborative action researchers are interested in a deeper, richer understanding of the topic of their research. This type of research also involves reflection, which provides the researcher an avenue to better

understand what was learned from the research process and to better understand the implications of the findings. The research continues by repeating the process again, and begins with either a completely new question or a refinement of the initial question based on what was learned during the first research sequence. Therefore, collaborative action research can be an ongoing recursive sequence; each completed series of research steps often referred to as a "cycle" of research. The term cycle is somewhat misleading, however, since the research never begins at the same point as the term "cycle" implies (Saurino, 1998).

Our Cycle of Collaborative Interactive Group Action Research (CIGAR)

Our action research process utilized a particular sequence of research techniques, strategies, and perspectives. The research group in our study consisted of two groups of pre-service elementary and secondary pre-service teachers, and two university collaborators. Ten weekly VTEL meeting sessions were scheduled throughout the fall quarter of 2002 for regular class meetings, and the last 20-30 minutes of each class were dedicated to conducting CIGAR. The group meetings provided a place where questions were asked and answered, problems were discussed, and reflections were expressed. The group setting also provided an avenue to brainstorm for new ideas, strategies, and techniques used to initiate actions, solve problems, and ultimately answer the research question.

The research process completed by our study involved four chronological phases and a planning phase for future cycles. The four chronological phases were based on the recursive collaborative interactive group action research cycle outlined below and illustrated in Figure 2:

Phase 1: August 2002	Planning phase of the project and Cycle 1
Phase 2: September 2002	Baseline data collection
Phase 3: October-November 2002	Actions and Interaction/Adjustment Sessions
Phase 4: December 2002	Repeat baseline data/Reflection for Cycle 1
Phase 5: January 2003	Return to Planning phase for future cycles

Phase 1 through 4 comprise the first research sequence of "Cycle 1" and Phase 5, and any following phases, might repeat the cycle to gain more information. After the first cycle,

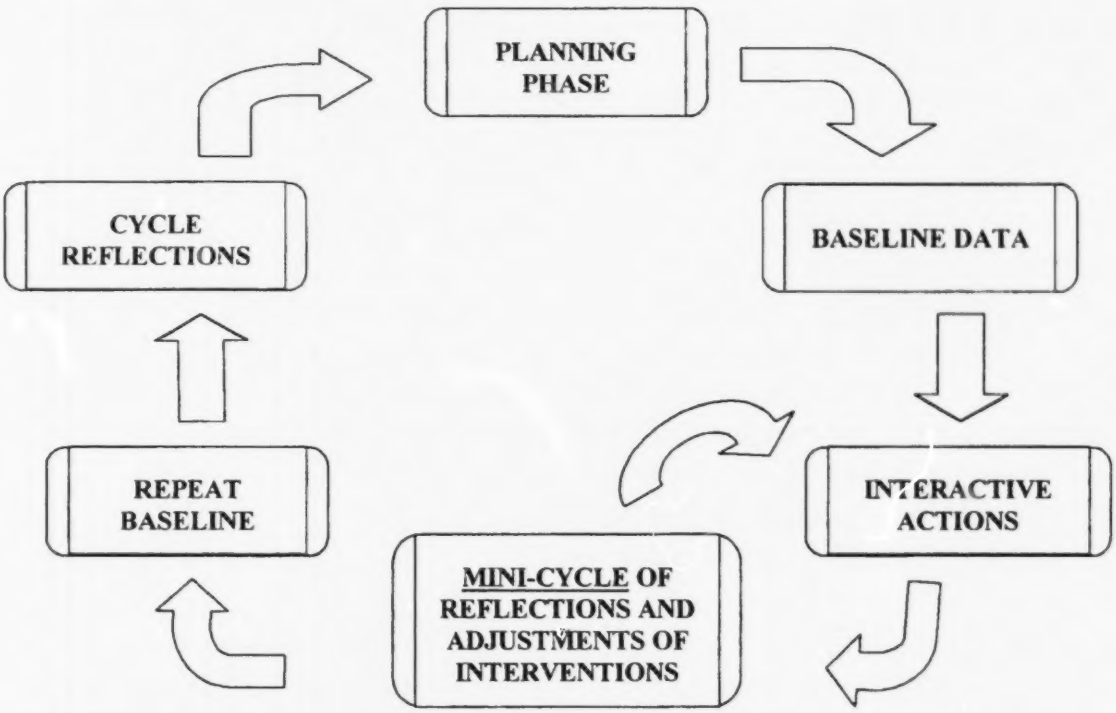

Figure 2. Illustration of one "cycle" of Collaborative Interactive Group Action Research

research questions could be modified or replaced, based on what was learned to date. A complete cycle, as was conducted in our study, consists of the phases outlined in Figure 2.

Planning Phase

Phase 1 (Planning Phase in Figure 2) began in August 2002 with initial meetings of the pre-service teachers and the university researchers. The students had volunteered to do the research after being contacted by the university researchers, but did not know any particulars about the process of conducting our type of research. The general plan of creating a research question, actions and interactions, collecting data, and reflecting was discussed and a basic timeline for the cycle of research was established. The students had a variety of questions and concerns that were expressed and discussed. Their most arduous concern dealt with the amount of time required to complete the project. The university researchers emphasized the fact that the process was flexible and the timeline could be adjusted. During the project, meetings were audio taped and field notes created from observations. In addition, everyone kept a personal journal. These data were the source for this written report. By the end of the planning phase we had finalized the research question for the cycle. The finalized research question for the university researchers was as follows:

How might we expand the use of collaborative interactive group action research to distance sites through video teleconferencing technology?

The pre-service teachers each chose a personal research question they could work on during their student teaching term as a means to learn the process of conducting CIGAR. We thought it would be beneficial for our teachers to try real actions with real students so that learning the process could be more meaningful and promote future use of the methodologies learned as professional development. Since they were not conducting "real" research, which required signed releases from university and school administrators, cooperating teachers, and parents of students, we were limited to normal actions and

activities as part of our pre-service teachers' normal student teaching. Their individual questions culminated in individual research papers that fulfilled part of the requirements for their summed research course. The student teaching environment did, however, provide the opportunity to ask and answer real research questions about topics of interest to our student teachers.

Graduate students from Eastern Oregon University, located in two different geographical locations participated in VTEL sessions as part of their course work for the Masters of Teacher Education Degree Program in the Fall of 2002. The main campus, located in rural North Eastern Oregon, consisted of more traditional students engaged often in their planned major with no real teaching experience within their major field of study. The extended campus, located in the South Eastern Oregon area, consisted of many students entering into their second career. These students held previous positions within the military, government, and other organizations conducive to extensive work experience. Students from both campuses had been selected to go through the program as a cohort, for a specified time frame until completion of the Master's Degree and Oregon teaching licensure.

Utilizing the concept of distance learning to enable distance students' personal internship experience was the major intention of the University researchers, with the additional time spent learning CIGAR an effort to enhance the process. The purpose was to provide the students with the opportunity to engage in discussion that could enhance their pre-service teaching experience in the Master's degree program. Each campus was equipped with appropriate technology such as televisions, cameras, and microphones to assist in establishing a personal connection with the cohort members. General mobile microphones were added for enhanced interaction throughout the sessions.

Baseline Data

Phase 2 (Baseline Data in Figure 2) involves answering the question, "What is the current situation in relation to our research question?" The answer in our case was that research was not part of the distance learning program currently in effect at Eastern Oregon University so we were introducing a new area to the distance learning structure. Research courses were currently being taught during the busy summer sessions when the pre-service teachers did not have access to classrooms, thus could not apply the research methodology they were learning in a practical way. Although both University researchers participated in all sessions, the traditional lecture style approach was excluded and replaced with shared experiential conversation as a learning tool. VTEL had previously been used in the lecture format to extend classrooms to easily distance sites, so the approach was a novel experience for all participants, as the first observations reflected.

Actions and Interactions

Phase 3 (Interactive Actions and the Mini Cycle in Figure 2) involved the actions we tried to answer our research question. Our actions included learning and completing a cycle of CIGAR during normal student teaching through the use of distance technology, which included not only VTEL, but email and chat rooms for distance communication. Long distance phone use was available, but not utilized due to the expense. Some reflections from our actions follow.

Early Actions. Our first discussion appeared awkward initially, as Northern (North East Oregon main campus) students reflected on possible curriculum and classroom management problems they might encounter in their upcoming student teaching, while Southern (South East Oregon satellite campus) students had already been in their

classrooms since southern school districts started two weeks early, and their initial reflections were dominated by topics such as how to develop complementary science/math lessons, comfort levels of State Teaching Standards with teachers, and making course work relevant. Northern students made reference to the abundance of technology in local schools and the conversation shifted to comparisons between Northern and Southern schools. There was a strong interest in the diversity of cultural experiences within the educational system in both areas. Students from the rural environment were more apprehensive about working with students from diverse backgrounds, perhaps because they were younger students who by and large had not experienced careers. Nevertheless, participants interpreted the initial sessions as an opportunity for cultural exchange. The introductory sessions also allowed the students to acquaint and familiarize themselves with the VTEL technology. The technology allowed for fluent interaction, yet there was a need for the groups to adapt to the flow from one campus to the other. As the conversation led to a verbalization of where students were with their respective research projects, the following excerpt reflected the content and pacing of the early interactions:

> Researcher #1 (Southern): Our students do not go out into the field for another two weeks. We are set up a little differently. (He continues to discuss what his students are presently engaged in).
>
> Researcher #2 (Northern): Our students have been working more with the CCGs (state standards) and they have been specifically looking at the local school environment. They will have some research questions for the group.
>
> Researcher #1: I think the best thing to do is to let the students start talking, so I am going to be quiet.

One of the Northern students began with a question having to do with how math and science were being integrated in the schools.

Student 1 (Southern): One of the things we've discovered with just our first three days in the classroom is that all of our cooperating teachers have a wide variety of experience with the CCGs (state standards) and integrated curriculum in middle school and high school.

Student 2 (Northern): I think some of us are kind of afraid to talk to you guys since we haven't had a chance to actually go into the schools yet. I know I'm looking forward to meeting with some of the teachers and talking to them about real life and what really goes on in the classroom.

Student 3 (Southern): (Describing his typical day in the classroom) it is difficult to get into a group environment (for integration) because of the old standard desks. There are no tables.

Researcher # 1: I think this makes a very good point about the control of facilities. Many times you have to overcome barriers.

Student 3: It is interesting to see all the technology they have available to the students. (describes all equipment being utilized) It will be interesting to see what is down here and what they have in the more rural areas.

Several topics were discussed in the session and individuals were encouraged to ask questions of personal interest, such as in the following exchange:

Student 4 (Northern): I know that I'm planning on putting this rural area to good use and implementing field notes and research actions as much as I can. Have any of

your cooperating teachers had any experience with that, and if so, do they think it works?

Student 5 (Southern): I know in my high school they take field trips to natural parks and even to (x) Hospital to watch open heart surgery. They may not have some of the same opportunities you see in your area, but they are certainly exposed to things outside the classroom.

Once the students had become familiar with the VTEL environment, communication became easier and more relaxed. Once both groups were in student teaching trying a variety of actions to answer their own questions, discussions became more focused.

Following Actions. The next several sessions maintained similar formats with discussion questions covering a variety of research questions. Some of the issues raised are included in the following excerpts:

Research Question: Do I perceive any instances of teacher preference or discrimination in my classroom, for example by gender, ethnic origin, or social class?

Student 6 (Southern): As far as I can tell in my classroom, the teacher calls on both genders equally and there does not appear to be any bias with perspective to any particular ethnic group.

Student 5: My cooperating teacher has made an effort to call on every student at least once and I'm trying to do this as well.

Student 7 (Southern): I'm teaching high school biology. The balance of my classroom is largely Hispanic. I have seen no preference except for students who are more performance driven, which is the tendency when the classrooms are large. The

focus is on the people who always have their hands raised and always turning their work in on time and listening attentively.

Researcher # 2 (Northern): Were there any signs of subtle discriminations, and I'll give you an example; pictures of famous mathematicians or scientists used in the classroom being inclusive rather than exclusive?

There was research questions regarding giving certain populations of students enough time to answer questions, or to write assignments. The recognition of body language used as avoidance of being called upon was also discussed, and as the term progressed, our student teachers began to reflect about how they were improving as teachers, as in the following:

Student 8 (Southern): When I first started, I would not call on kids unless they raised their hand. Then I went to "back to school night" where parents expressed their concern over their kids not being called on. They didn't want their kids to be excluded, or to get away with no participation. Some just needed a little push to get going.

Student 7: I was happily able to discover they have a flexible camera in my classroom and I was able to get the microscope in focus with the cell I was looking at. Being able to broadcast the microscope onto the screen in the classrooms helps the students tremendously to stay involved.

Student 9 (Northern): Yesterday, I used a bag of M&Ms. They (my students) pour them out on the table and sort them. They have tables and graphs to fill out. They get to talk about their experience and everybody seems happy. Plus, they get to eat the M&Ms (candies).

Student 5: Our class field trip collected various specimens in (a nearby state) from several sites. We spent the next two weeks classifying them and then sometimes some taxidermy when they died prematurely. We did all sorts of preservation and went through a really healthy analysis of everything. The kids were amazingly involved.

Repeat of Baseline Data and Cycle Reflections

Phase 4 (Repeat Baseline and Cycle Reflections in Figure 2) included again answering the question, "Now what is the current situation concerning our research question?" and included our comparison and contrast of our early baseline data to stimulate reflective discussions about the entire cycle of research. Our last sessions included topics such as motivation of students, tracking, and professional growth of the student teachers, and culminated with a discussion of the benefits and difficulties of the VTEL technology as a means to expand the use of CIGAR to distance sites. Highlights of the summary discussions with some of the positive and negative aspects of the sessions follow:

Researcher # 1: Can we go on to some summary questions? What benefits have you received from the CIGAR project through our VTEL sessions?

Student 4 (Northern): I found that it was helpful because I know there was a difference between that part of the country and this part of the country concerning my research question. I think it is important to realize the differences and similarities.

Student 8 (Southern): I think the VTEL seminars amongst ourselves were extremely helpful because you realized you weren't alone. It's nice to know that you're not

the only one trying things and making mistakes - that it happens in this area and yours (the Northern area) as well.

Student 2 (Northern): Part of the battle is knowing what you are getting into. In this project I have been able to see education in different environments. Discussing education and teaching in a rural environment has given me a bigger picture of the responsibility that we as educators have. I think that is going to be important whether we are in an urban or rural area. I think it has a big impact on how we view our classrooms and view our situations.

Researcher # 1: Let's expand our discussion to negative aspects of VTEL.

Student 9 (Northern): I find it hard. I don't know where to look and where to talk. I think it's kind of hard to actually do this. It's much harder than if you guys were in the same room.

Researcher # 1: Has it gotten easier over the term?

Student 9: We have been in three different (VTEL) rooms, but I guess it has gotten easier.

Student 7 (Southern): The pace of the VTEL is annoying to me, and I think we would recognize more in common if we didn't have a pause every time the camera is focusing ... I think you have to spend extra effort coordinating who is going to talk next ... which is more cumbersome.

Researcher # 1: Let's do a little brainstorming about what we can do in the future given this technology ... what can we pursue in the future that would be of interest to you?

Student 1 (Southern): Maybe have smaller groups where we can see everyone. It helps to be able to see everyone at once.

Student 3 (Southern): I like it when we come up with a set of questions of interest to us. I feel better prepared to come in and discuss things. Maybe the first few minutes more structured discussion, and the rest unstructured.

Student 2 (Northern): I really like the idea of structure. If someone solicited particular answers or responses from us individually and prearranged for us to do three or four minute presentations, then allow for some complimentary ideas from our colleagues, that would better address any questions we all might have.

Researcher # 2: I was going to say something very similar to that and I guess great minds run together. Maybe we can have mini-presentations with the concept of a panel discussion.

Participants in the VTEL sessions also completed anonymous evaluations. Many noted positive and negative points about the technology. Many reacted negatively to the intrusive nature of the camera, like this Northern student, "...the technology was somewhat distracting. I personally felt like I was watching a show - wondering where the camera would move next, etc." That same student later wrote that, "The positives far outweigh the negatives ... It was really good to hear some of the experiences of the (Southern) students." Another Northern student wrote, "I was honestly interested in hearing about their actions, especially how they are interacting with their students when they try new things, and in discussing what really works and doesn't in today's schools." And still another wrote, "The (Southern) students had valuable tidbits to share with us. I am particularly interested in the

block scheduling because I have no experience with it and know that it is the direction in which schools are now moving."

Summary and Conclusions

Through video teleconferencing, students were able to reflect on their own growth as teachers by comparing and contrasting their experiences with others working in different cultures and locations while completing similar CIGAR research projects. Students expressed interest in the others' projects and in teaching experiences in cultures different from their own. Although rural students were exposed to less cultural diversity in their setting, they learned what to anticipate if they applied for jobs in completely different teaching environments. Students thought about their own teaching and about issues such as educational standards by comparing how standards were being met in different schools. Overall, the teleconferencing facilitated sharing of different viewpoints and teaching strategies, and was an acceptable medium to expand the use of CIGAR to distance sites.

The CIGAR research process was helpful in deciding what questions to ask and what topics to address for our student teachers as they were able to brainstorm and discuss topics of interest in the group format. Student feedback was received the feedback was used to design the structure of subsequent CIGAR projects using teleconferencing technology as well as email and chat rooms. Communication between the researchers from the two sites was enhanced by regular emails and phone conversations. This mutual support network is essential for planning and articulation of strategies to use the technology effectively. We recommend, and will personally pursue, more standardized research projects utilizing VTEL and other technologies in the future.

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